

COMPARISON OF THE ROLE OF PRE AND POST OPERATIVE HEMATOLOGICAL DERANGEMENTS WITH RESPECT TO THE POST OPERATIVE CLINICAL OUTCOME IN VARIOUS SUBSETS OF OPERATED ACUTE POST TRAUMATIC HEAD INJURY CASES

ABSTRACT

AIM OF THE STUDY

Comparison of the role of pre and post operative hematological derangements with respect to the post operative clinical outcome in various subsets of operated acute post traumatic head injury cases.

MATERIALS AND METHODS:

This is a prospective analytical study of 236 consecutive cases conducted from AUGUST 2016 at Institute of Neurosurgery, Madras Medical College, Chennai. All patients will undergo a detailed neurological and preoperative haematological examination before the patients undergo emergency surgery.

Post op bleed profile was done on post op day 3 and 7.

Type of Study : Prospective Analytical Study

Place of study:

Institute of Neurosurgery and Rajiv Gandhi Government General hospital, Chennai-3

No of Patients: 236

Inclusion Criteria:

- All patients who are willing to take part in the study and sign the consent form . Attender's consent taken if patient not in gcs15/15 (Both Male and Female)
- All operated TRAUMA cases in emergency OT
- Divided into 3 subsets of
 - calvarial fracture +/- EDH predominant cases (extra dural plane),
 - Acute SDH predominant cases (between dura and pia)
 - Acute post traumatic contusion and intra cerebral hemorrhage (sub pial intra axial parenchymal plane)

Exclusion Criteria:

- Patients with pre existing coagulation disturbances OR Patients who were taking anticoagulants within 72h of surgery timing
- Emergency operated Patients not related to trauma (eg Hydrocephalus, Chronic SDH, Infarct or CVA with mass effect, any revision surgery for bone flap removal)
- Trauma patients with co existing quadriplegia on presentation
- Patients in whom preop bleed profile could not be evaluated
- Patients not willing to take part in the study or patients not willing for surgery

Methodology:

GCS motor score (GCSM) is equivalent to GCS for prehospital triage, and in view of its simplicity it should replace the GCS in triage schemes.³ Hence, this study utilises only pre operative motor score of GCS. Further , use of only motor score simplified the study design and the statisticians had to deal only with one dimension of GCS (motor-6 subdivision only) Patient was considered to deteriorate if motor score deteriorated by atleast one motor score at end of 7 days, after which there was minimal chance of bleed progression and minimal chance of blood transfusions

Any derangement of blood parameters like platelet dysfunction, deranged prothrombin time , deranged aPTT, deranged hematology tests was considered haematological derangement for purpose of the study. (Further, subclassifying each and every individual derangements and the documenting the extent of derangements was not the purpose of the study considering the data base size.)

Statistical analysis was done on outcomes of various subsets of TBI.

This study hopes to find out the correlation between hematological derangement and postoperative outcome in the various subsets of traumatic brain injury

Ethical Clearance: Obtained

Consent : An informed consent was obtained from all the patients

Financial Support : Nil

Analysis:

Statistical analysis was done with IBM spss 24 software and some graphical data was done using Microsoft excel software. Chi square tests were applied to test the statistical significance and risk estimate was done to determine the strength of association between the compared groups.

Outcome Analysis:

- Pre op Hematology Status vs Post Op Clinical Outcome Status
- Post Surgery Hematology Status vs Post Op Clinical Outcome Status
- Pre Op Gcs Motor Score Status vs Post Op Clinical Outcome Status

Hematological Correlation with post operative outcome analysis

- Pre Op Hematology Status vs Post Surgery Hematology Status
- Pre Op Motor Status vs Post Op Clinical Outcome Status subdivided by Pre Op Hematology Status
- Pre Op Motor Status vs Post Op Clinical Outcome Status subdivided by Post Op Hematology Status
- Pre Op Hematology Status vs Post Surgery Hematology Status subdivided by Post Op Clinical Outcome Status
- Pre Op Hematology Status vs Post Surgery Hematology Status subdivided by Preop Motor Status

Bleed plane subset vs outcome analysis:

- Edh Presence vs Pre Op Hematology Status subdivided by Post Op Outcome Status
- Edh Presence vs Post Op Hematology Status subdivided by Post Op Outcome Status
- Sdh Presence vs Pre Op Hematology Status subdivided by Post Op Outcome Status
- Sdh Presence vs Post Op Hematology Status subdivided by Post Op Outcome Status
- Contusion Presence vs Pre Op Hematology Status subdivided by Post Op Outcome Status
- Contusion Presence vs Pre Op Hematology Status subdivided by Post Op Outcome Status

Observations:

There was a 2 times (2.092x) higher relative risk of having a worse clinical postoperative outcome in pre operative haematological deranged patients overall. The above results are statistically significant ($p < 0.05$).

There was a 2.4 times (2.405x) higher relative risk of having a worse clinical postoperative outcome in post operative haematological deranged patients overall. The above results are also statistically significant ($p < 0.05$)

The relative percentage between the post operatively improved and deteriorated cases in each motor scale subgroup were analysed . Percentage analysis showed a higher improvement percentage in post operative outcome as the GCS motor score increased from 2 to 6.

The various bleed plane subsets were analysed with respect to role of pre operative haematological derangement, post operative haematological derangement and post operative outcome. Significant results are mentioned in the conclusion.

Conclusion:

Within the 'EDH' , 'SDH' as well as 'Contusion' subgroups, it has been found that the improved postoperative outcome is associated with normal pre operative hematological status with a statistical significance of p value less than 0.05.

However, the presence of worse post operative clinical outcome has not been found to be within the statistically significant (p value not < 0.05 limits) when correlated with presence of hematological derangements in both EDH as well as SDH subgroups.

Post surgical hematological derangements were also not correlating with outcome in SDH subgroup with present data in a statistically significant manner (p value < 0.05 limits)

In the subgroup of contusions, it has been found that the improved postoperative outcome is associated with the absence of hematological derangement (pre op as well as post op). But, one new thing to note in this contusion subgroup is that the postoperative worse outcome is also associated with pre surgical

hematological derangement in a statistically significant way (unlike EDH & SDH subgroups).

There was a 40 times higher odds of having persistent post surgical derangement in patients operated with pre surgical haematological derangement despite standard treatment.

In general, if the pre surgical motor score was higher, the hematological derangements were lower and the post operative outcome was better.

Keywords

Haematological Derangement, Post Operative Outcome, EDH, SDH, Contusion , GCS-Motor Score.